

APPENDIX F—AQUATIC AND RIPARIAN MANAGEMENT STRATEGY—ALTERNATIVES B, C, AND D

INTRODUCTION

The Aquatic and Riparian Management Strategy provides guidance and programmatic direction for aquatic and riparian conservation and restoration and is integrated with other management direction. Conservation of fish, wildlife, plants, and habitats at risk should be considered together with the full array of broad-scale ecosystem components addressed by the strategy: landscape dynamics, terrestrial source habitats, aquatic species and riparian and hydrologic processes, and social-economics and tribal governments.

The key components of the Aquatic and Riparian Management Strategy are as follows:

- Aquatic and riparian management direction (for example, goals, objectives, and desired conditions).
- Establishment of RCAs, which are areas where aquatic and riparian dependent resources receive management emphasis.
- Protection of population strongholds for listed or proposed species and narrow endemics.
- Multiscale analysis and how it will be used in subsequent project-level decisions.
- Restoration priorities and guidance will be identified for geographic areas and by general type.
- Monitoring/adaptive management to determine if plan is being implemented correctly and is achieving desired results.
- Standards and Guidelines and BMPs, which are applicable to all RCAs and to projects and activities in areas outside of RCAs that are identified through NEPA analysis as potentially degrading RCAs.

RIPARIAN GOALS

The goals establish an expectation of the characteristics of healthy, functioning, watersheds, riparian areas, and associated fish habitats. Because the quality of water and fish habitat in aquatic systems is inseparably related to the integrity of upland and riparian areas within the watersheds, the goals are to maintain or restore the following:

1. Water quality, to a degree that provides for stable and productive riparian and aquatic ecosystems.
2. Stream channel integrity, channel processes, and the sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which the riparian and aquatic ecosystems developed.
3. Instream flows to support healthy riparian and aquatic habitats, the stability and effective function of stream channels, and the ability to route flood discharges.
4. Natural timing and variability of the water table elevation in meadows and wetlands.
5. Diversity and productivity of native and desired nonnative plant communities in riparian zones.

6. Riparian vegetation to:
 - a. Provide an amount and distribution of large woody debris characteristic of natural aquatic and riparian ecosystems;
 - b. Provide adequate summer and winter thermal regulation within the riparian and aquatic zones; and
 - c. Help achieve rates of surface erosion, bank erosion, and channel migration characteristic of those under which the communities developed.
7. Riparian and aquatic habitats necessary to foster the unique genetic fish stocks that evolved within the specific geo-climatic region.
8. Habitat to support populations of well-distributed native and nonnative plant, vertebrate, and invertebrate populations that contribute to the viability of riparian-dependent communities.

AQUATIC AND RIPARIAN MANAGEMENT DIRECTION

The BLM is encouraged to establish area-wide riparian management objectives (RMO) and to apply them where analysis for determining area-wide specific RMOs has not been done. Aquatic and riparian habitat condition indicators are rated for functional condition using the Matrix of Pathways and Indicators of Watershed Condition, which has local adaptation (1997 and modified 1998) and use by the North Central Idaho Level 1 Team (BLM CFO, Nez Perce National Forest, Clearwater National Forest, National Marine Fisheries Service, and USFWS). With updated monitoring, science/literature, and supporting rationale, watershed indicators may be changed in the future to more accurately depict local planning area aquatic, riparian, and watershed condition indicators. **Table F-1** depicts the Watershed Condition Indicators included in the referenced matrices.

Table F-1
Pathways—Indicators of Watershed/Aquatic Conditions¹

Watershed Conditions	Habitat Elements
1. Watershed road density	1. Cobble embeddedness
2. Streamside road density	2. Percent surface fines
3. Landslide prone road density	3. Percent fines by depth
4. Riparian vegetation condition	4. Large woody debris
5. Peak/base flow	5. Pool frequency
6. Water yield (equivalent clearcut acres)	6. Pool quality
7. Sediment yield	7. Off-channel habitat
	8. Habitat refugia
Channel Condition and Dynamics	Take
1. Width/depth ratio	1. Harassment
2. Streambank stability	2. Redd disturbance
3. Floodplain connectivity	3. Juvenile/adult harvest
Water Quality	Subpopulation Characteristics and Habitat Integration
1. Temperature—spawning	1. Subpopulation size
2. Temperature—rearing/migration	2. Growth and survival
3. Suspended sediment	3. Life history diversity, isolation
4. Chemical contaminants/nutrients	4. Persistence and genetic integrity
	5. Integration of species and habitat condition

Table F-1
Pathways—Indicators of Watershed/Aquatic Conditions¹(continued)

Habitat Access
1. Physical barriers—adults
2. Physical barriers—juveniles

¹Watershed indicators from USFWS and National Marine Fisheries Service matrices as adapted by North Central Idaho Level 1 Team (1997 and 1998 modification)

Desired and achievable Watershed Condition Indicators need to be identified that are specific to the project/activity plan implementation at the subwatershed level (for example, 5th, 6th, 7th code HUC). The functional condition ratings for Watershed Condition Indicators is a subjective rating for desired aquatic, riparian, and watershed functional conditions adapted locally for providing for optimal aquatic, riparian, and watershed conditions for TES species.

RIPARIAN CONSERVATION AREAS, ALTERNATIVE B

RCAs are portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines. However, they are not intended to be treated as no management zones since treatments may be essential to achieving or maintaining desired riparian and aquatic conditions. This strategy allows for adjustment to RCAs to reflect site conditions recognizing watershed wide riparian conditions and trends.

Important values to consider in identifying and managing RCAs include fine organic litter, bank stability, sediment control, nutrients and other dissolved materials, riparian microclimate and productivity, wind throw, importance of small (perennial and intermittent) streams, importance of hill slope steepness, parent soil material and erosion risks, potential and active large woody debris, and riparian functional condition.

Default RCA widths apply where watershed analysis has not been completed. Establishment of RCAs requires watershed analysis to provide the ecological basis for the change. However, RCAs may be modified by amendment in the absence of watershed analysis where stream reach or site-specific data support the change. In all cases, the rationale supporting RCA widths and their effects would be documented. Refer to previous listed important values for managing RCAs; pertinent values need to be specifically addressed in supporting rationale for modifying RCAs.

Category 1—Fish-bearing streams: RCAs consist of the stream and the area on either side of the stream. This area extends from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of the riparian vegetation, or **300 feet** slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Category 2—Permanently flowing non-fish-bearing streams: RCAs consist of the stream and the area on either side of the stream. This area extends from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of the riparian vegetation, or **150 feet** slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

Category 3—Ponds, lakes, reservoirs, and wetlands greater than one acre: RCAs consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or **150 feet** slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, pond, or lake, whichever is greatest.

Category 4—Seasonally flowing or intermittent streams and wetlands less than one acre: This category includes features with high variability in size and site-specific characteristics. The RCA is the area from the edges of the stream channel, the wetland, the extent of riparian vegetation, or **80 feet** slope distance, whichever is greatest.

Nonforested rangeland ecosystems Category 1 and 2 streams are the extent of 100-year floodplain.

RIPARIAN CONSERVATION AREAS, ALTERNATIVE C

RCAs are portions of watersheds where riparian-dependent resources receive primary emphasis and management activities are subject to specific standards and guidelines.

RCA widths apply where watershed analysis has not been completed. Establishment of RCAs requires watershed analysis to provide the ecological basis for the change. However, RCAs may be modified by amendment in the absence of watershed analysis, where stream reach or site-specific data support the change. In all cases, the rationale supporting RCA widths and their effects would be documented.

Category 1—Fish-bearing streams: RCAs consist of the stream and the area on either side of the stream. This area extends from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of the riparian vegetation, or **300 feet** slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Category 2—Permanently flowing non-fish-bearing streams: RCAs consist of the stream and the area on either side of the stream. This area extends from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of the riparian vegetation, or **225 feet** slope distance (400 feet, including both sides of the stream channel), whichever is greatest.

Category 3—Ponds, lakes, reservoirs, and wetlands greater than one acre: RCAs consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or **150 feet** slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, pond, or lake, whichever is greatest.

Category 4—Seasonally flowing or intermittent streams and wetlands less than one acre: This category includes features with high variability in size and site-specific characteristics. The RCA is the area from the edges of the stream channel, the wetland, the extent of riparian vegetation, or **125 feet** slope distance, whichever is greatest.

Nonforested rangeland ecosystems Category 1 and 2 streams are the extent of 100-year floodplain

RIPARIAN CONSERVATION AREAS, ALTERNATIVE D

RCA's are portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines.

RCA widths apply where watershed analysis has not been completed. Establishment of RCA's requires watershed analysis to provide the ecological basis for the change. However, RCA's may be modified by amendment in the absence of watershed analysis where stream reach or site-specific data support the change. In all cases, the rationale supporting RCA widths and their effects would be documented.

Category 1—Fish-bearing streams: RCA's consist of the stream and the area on either side of the stream. This area extends from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of the riparian vegetation, or **300 feet** slope distance (600 feet, including both sides of the stream channel), whichever is greatest.

Category 2—Permanently flowing non-fish-bearing streams: RCA's consist of the stream and the area on either side of the stream. This area extends from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of the riparian vegetation, or **150 feet** slope distance (300 feet, including both sides of the stream channel), whichever is greatest.

Category 3—Ponds, lakes, reservoirs, and wetlands greater than one acre: RCA's consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or **50 feet** slope distance, whichever is greatest.

Category 4—Seasonally flowing or intermittent streams and wetlands less than one acre: This category includes features with high variability in size and site-specific characteristics. The RCA is the area from the edges of the stream channel, the wetland, the extent of riparian vegetation, or **50 feet** slope distance, whichever is greatest.

Nonforested rangeland ecosystems Category 1 and 2 streams are the extent of 100-year floodplain

PROTECTION OF POPULATION STRONGHOLDS FOR AQUATIC SPECIAL STATUS AND NARROW ENDEMIC SPECIES

Refer to **Appendix C**, Conservation and Restoration Watersheds, for criteria and identification of conservation watersheds, which have important value for protecting populations of special status aquatic species and narrow endemics. Currently, only a few watersheds within the BLM planning area meet the criteria for designation as a stronghold or conservation watershed for special status species. The intent of this designation and management direction of these watersheds is that they will provide high quality habitat for species and will support expansion and recolonization of species to adjacent watersheds. These areas should conserve key processes likely to influence the persistence

of populations or metapopulations. Management consideration for these watersheds includes the following:

- In general, these areas are at the scale of the species' subpopulation and contribute to their conservation and recovery.
- Characteristics/considerations for stronghold delineation include high genetic integrity, connectivity, relationship of the subpopulation to the species as a whole, and restoration and population expansion potential into adjoining watersheds.
- The plan provides for additions to, deletions from, or modifications of strongholds and conservation watersheds based on new information.
- As with RCAs, management activities in strongholds and conservation watersheds should emphasize achieving or maintaining the riparian and aquatic values, including key processes, for which they are being managed. Active management within strongholds may be required to achieve and maintain these values. Passive management strategies can also be an effective tool for meeting stronghold objectives in some watersheds.
- Conservation subwatersheds have watershed processes and functions that occur in a relatively undisturbed and natural landscape setting.
- Watersheds may also be identified for such purposes as protecting other emphasis species or other high value riparian-dependent resources.

MULTISCALE ANALYSIS AND ECOSYSTEM ANALYSIS AT THE WATERSHED SCALE

The purpose of an ecosystem analysis at the watershed scale is to develop and document an understanding of the ecological structures, functions, processes, and interactions occurring at the watershed scale. This process is designed to describe past and current conditions and develop restoration and management recommendations. The ultimate goal is to provide guidance for management actions that would sustain or improve the health and productivity of natural resources.

The Federal Guide for Watershed Analysis—Ecosystem Analysis at the Watershed Scale Version 2.2 (Forest Service 1995) was used as a guide. This six-step process is not issue-driven but focuses on analysis topics, along with specific watershed problems and concerns. This analysis is not a decision making process but will help identify opportunities for future management actions, including planning, project development, and regulatory compliance. Below is a summary of each of the six steps taken to develop an ecosystem analysis at the watershed scale.

Step 1—Characterization of the Watershed

The purpose of Step 1 is to identify the dominant physical, biological, and human processes or features of the watershed that affect ecosystem functions or conditions, including the relationship between these ecosystem elements and those occurring in the river basin. When characterizing the watershed, teams identify the most important land allocations, plan objectives, and regulatory constraints that influence resource management in the watershed.

Step 2—Identification of Issues and Key Questions

The purpose of this step is to focus the analysis on the key elements of the ecosystem that are most relevant to the management questions and objectives, human values, or resource conditions within the area.

Step 3—Description of Current Conditions

This step is to develop more detailed information relevant to the issues and key questions identified in Step 2. Step 3 is where the current range, distribution, and condition of the relevant ecosystem elements are documented.

Step 4—Description of Reference Conditions

This step is to explain how ecological conditions have changed over time as a result of human influence and natural disturbances. A reference is developed for later comparison with current conditions over the period that the system evolved and with key management plan objectives.

Step 5—Synthesis and Interpretation of Information

The purpose of Step 5 is to compare existing and reference conditions of specific ecosystem elements and to explain significant differences, similarities, or trends and their causes. The capability of the system to achieve key management plan objectives is also evaluated.

Step 6—Recommendations

The purpose of Step 6 is to identify management recommendations that address resource problems noted in this analysis and then to change the current watershed conditions toward the desired future condition for this area. Recommendations, monitoring needs, and data gaps are identified and described. These are recommendations to date based on the data we have available at present. This is an ongoing process and alternative or additional recommendations may be made in the future.

Multiple-scaled Assessments

No single assessment will adequately address the complex issues facing resource managers today. Fine-scale assessments provide necessary context for management and project planning, but they cannot adequately address broad patterns and processes, such as habitat conditions for wide-ranging species. Broad-scale assessments provide necessary context for policy formulation and for mid- and fine-scale assessment, but they cannot by themselves provide detailed information, such as site-specific habitat conditions. Together, multiple-scale assessments provide a comprehensive basis for sustainable land management.

Four levels of review and assessment provide the context to appropriately implement broadscale decisions on individual Bureau of Land Management districts and within a field office area. As needed, multiscale analysis may be used for future plan amendments or revisions and for subsequent project-level decisions. The four potential analysis scales are basin, subbasin, watershed, and project. Analysis at the appropriate scale is generally recognized to provide needed context for (and thus it

improves) decision making. Following are the four levels of review/assessment that will be used for multiscale analysis:

1. Broad-scale (e.g., Assessment of Ecosystem Components in the Interior Columbia Basin;
2. Mid-scale (e.g., Ecosystem Review at the Subbasin Scale);
3. Fine-scale (e.g., Ecosystem Analysis at the Watershed Scale);
4. Site-scale (e.g., project/site analysis).

Management considerations for multiscale analysis includes the following:

- Plans are generally developed and analyzed at the scale of the land management unit, normally analogous to a subbasin (or group of subbasins) scale.
- Subsequent finer scale analysis, such as to support restoration prioritization and monitoring strategy development, should include interagency coordination.
- Assessments should include evaluation of existing conditions, factors limiting aquatic species populations, resource risks, management needs, and restoration opportunities.
- Information developed at the finer scale should be considered in implementing the aquatic conservation elements and used to make adjustments or modifications to the elements, as warranted.
- Multiscale analysis provides a basis for integrating and prioritizing conservation measures for wide-ranging species.

MONITORING AND ADAPTIVE MANAGEMENT

The basics of RMP level monitoring should (1) determine if the plan is being implemented correctly and is achieving desired results, (2) provide a mechanism for accountability and oversight, (3) evaluate the effectiveness of recovery and restoration efforts, and (4) provide a feedback loop so that management direction may be evaluated and modified.

Management considerations for monitoring include the following:

- Focus monitoring on key questions that inform decision making and allow adjustments to management.
- Monitoring emphasis and intensity should be commensurate with the importance of the question being asked. For example, if adaptive decision making is being used, it will be important to monitor the key parameters to the degree necessary to support the current course of action or to trigger an alternate approach.
- Plan level monitoring should make use of, and not duplicate, broad-scale monitoring programs. To the extent practicable, monitoring done at the plan scale should be compatible with, and complementary to, broader and finer scale monitoring.
- Monitoring should be coordinated with, and where possible consolidated with, similar efforts of other agencies.
- Outcome-based management approaches rely on monitoring for their success. These approaches typically require a different level and type of monitoring than prescriptive approaches.
- Monitoring commitments in plans should be feasible and achievable.

Monitoring is a process of gathering information through observation and measurement to ensure that project design criteria and mitigation are implemented and to determine if goals and objectives for project/program are achieved. The two types of monitoring identified are implementation and effectiveness. Specifics of these types of monitoring are described below:

- Implementation monitoring is used to determine if management practices are implemented as identified in an activity plan, environmental assessment, EIS, Biological Assessment, or Biological Opinion.
- Effectiveness monitoring is used to determine if management practices, as designed and executed, are effective in meeting project goals and objectives as defined in an activity plan, environmental assessment, EIS, Biological Assessment, or Biological Opinion.

The results of all monitoring will be summarized and shared, as requested, with state and federal agencies, tribes, private groups, or individuals.

The design criteria and mitigation would be monitored on a specific action or subsample of activity or project. Agency representatives overseeing the actions would do the monitoring, as well as an interdisciplinary or multiparty team, through a combination of any of the following methods:

- Review environmental assessment, Biological Assessment, and Biological Opinion identified project specifications and terms and conditions to ensure that monitoring is provided for in contract or plan of operation (project design and mitigation criteria);
- Review designs and plans of operation;
- Review contract administration reports (daily diaries); and
- Review activities on the ground before, during, and after implementation.

Where appropriate, photograph conditions before the project begins, during its implementation, and after it is completed.

RESTORATION PRIORITIES AND GUIDANCE

Refer to **Appendix C**, Conservation and Restoration Watersheds, for criteria and identification of restoration watersheds, which have priority for restoration projects and achievement of desired conditions. Restoration subwatersheds were identified because biological and physical processes and functions do not reflect natural conditions because of past and long-term land disturbances. Management consideration for these watersheds includes the following:

- Identify restoration objectives, desired conditions, and the types of management actions likely to be used to achieve those objectives or desired conditions;
- Make finer scale prioritization a part of plan implementation rather than plan development;
- Support restoration prioritization with analysis at the appropriate scale (e.g., subbasin, watershed);
- Integrate aquatic and terrestrial restoration priorities;
- Emphasize restoration opportunities that provide benefits for multiple resources; and

- Structure the plan to provide for additions to, deletions from, or modifications of restoration watersheds based on new information.

STANDARDS AND GUIDELINES

Standards and guidelines apply to all RCAs and to projects and activities in areas outside of RCAs that are identified through NEPA analysis as potentially degrading RCAs.

Standards and Guidelines	Conservation Measures
<i>Riparian Conservation Areas</i>	
RCA-1	<p>Activities in RCAs or activities outside RCAs that affect desired conditions must be designed to enhance, restore, or maintain the physical and biological characteristics of the RCA by implementing the following:</p> <ul style="list-style-type: none"> • Activities outside or in RCAs that are intact and functioning in a desired condition, as indicated by RMOs or other measures, must be designed to at least maintain that desired condition; • Activities outside or in RCAs that are not at desired condition, as indicated by RMOs or other measures, should include a restoration component as part of the project; and • c. Activities outside or in RCAs must not result in long-term degradation to aquatic conditions. Limited short-term effects from activities in the RCA may be acceptable when outweighed by the long-term benefits to the RCA and aquatic resources.
<i>Timber Management</i>	
TM-1	Vegetation management practices, such as timber harvest, salvage logging, fuelwood cutting and fuels treatments, may be used in RCAs. Vegetation treatments will be allowed only to restore or enhance physical and biological characteristics of the RCA. Implemented treatments will, at a minimum, maintain RMOs.
<i>Roads Management</i>	
RF-1	Cooperate with federal, tribal, state, and county agencies and cost-share partners to achieve consistency in road design, operation, and maintenance necessary to attain RMOs.
RF-2	For planned roads in an RCA, manage achieve RMOs and to avoid or minimize adverse effects on TES fish.

Standards and Guidelines	Conservation Measures
RF-2a	<p>Complete a site-specific analysis, tiering to existing watershed analyses where available, before building new roads or landings in RCAs. The level of analysis should be commensurate with the scope and issues of the project and related aquatic resources.</p> <p>At a minimum, the analysis should in all cases address sediment, LWD supply/recruitment, water temperature, and floodplain and riparian encroachment. Analysis will include the site scale, in the context of the reach scale, and watershed scales.</p>
RF-2b	<p>Minimize new road and landing locations in RCAs.</p> <p>Permanent new roads are not allowed unless long-term management needs can be identified.</p>
RF-2c	<p>Initiate development and implementation of a road management plan or a transportation management plan for BLM-controlled roads. At a minimum, address the following items in the plan:</p> <ul style="list-style-type: none"> • Road design criteria, elements, and standards that govern construction, reconstruction, and maintenance; • The long-term management needs for each road; • Road management objectives for each road; • Criteria that govern road operation, maintenance, and management; • Guidance for inspections and maintenance before, during, and after storms; • Traffic regulation during wet periods to minimize erosion and sediment delivery; • Monitoring plans for road stability, drainage, and erosion control; and • Mitigation plans for road failures.
RF-2d	<p>Temporary roads within RCAs will be decommissioned a maximum of three years after their construction.</p>
RF-2e	<p>Avoid sediment delivery to streams from the road surface.</p> <ul style="list-style-type: none"> • Outsloping the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe; • Route road drainage away from potentially unstable stream channels, fills, and hillslopes.
RF-2f	<p>Avoid or minimize adverse impacts on natural hydrologic flow paths.</p>
RF-2g	<p>Avoid sidecasting road surface material, which is prohibited on road segments within or leading into RCAs.</p>

Standards and Guidelines	Conservation Measures
RF-3	<p>Avoid adverse effects on TES fish by implementing the following:</p> <ul style="list-style-type: none"> Relocating or reconstructing roads and drainage features that are not effective at controlling sediment delivery; Prioritizing reconstruction based on the current and potential habitat damage and the ecological value of the riparian resources affected; and Stabilizing, closing, or obliterating roads not needed for future management activities. Prioritize these actions based on the current and potential damage to native fish and the ecological value of riparian resources affected.
RF-4	<p>New and replacement stream crossings must be designed to:</p> <ul style="list-style-type: none"> Accommodate a 100-year flood, including associated bedload and debris; Maintain fish and aquatic organism passage; and Maintain channel integrity. <p>For replacement crossings, potential benefits will be greater than the potential degradation to riparian conditions.</p> <p>See road construction and maintenance BMPs RF2c-1.</p>
RF-5	Refer to Road Management Guidelines in Appendix B (Best Management Practices) for a complete list of road management standards and guidelines.

Grazing Management

GM-1	Modify grazing practices (e.g., accessibility of riparian areas to livestock, length of grazing season, stocking levels, and timing of grazing) that retard or prevent attainment of RMOs or that are likely to adversely affect TES fish. Suspend grazing if adjusted practices are not effective in meeting RMOs and avoiding adverse effects on TES fish.
GM-2	Locate new livestock handling and management facilities outside of RCAs. Ensure that existing livestock handling facilities inside RCAs do not prevent attainment of RMOs or adversely affect TES fish. Relocate or close facilities where these objectives cannot be met.
GM-3	Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that would not prevent or retard attainment of RMOs or adversely affect TES fish.
GM-4	Develop and implement grazing practices in areas of known or suspected TES fish spawning to avoid or reduce trampling of redds and other direct and indirect effects that may result in adverse impacts on the species.

Standards and Guidelines	Conservation Measures
<i>Recreation Management</i>	
RM-1	<p>Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of the RMOs and that avoids adverse effects on TES fish. Complete watershed analysis before building recreation facilities in RCAs. The level of watershed or site-specific analysis should be commensurate with the scope and issues of the project and related aquatic resources. For recreation sites, the level of analysis would be more detailed for 5th code HUCs and smaller, while for mainstem rivers (4th code HUCs) the ability to adversely affect RMOs may not be as significant.</p> <p>At a minimum, the analysis should in all cases address sediment, LWD supply/recruitment, water temperature, and floodplain and riparian encroachment. Analysis will include the site scale, in the context of the reach scale, and watershed scales. Depending on site characteristics, additional factors may be included.</p> <p>For existing recreation facilities inside RCAs, ensure that the facilities or use of the facilities will not prevent attainment of RMOs or adversely affect TES fish. Relocate or close recreation facilities where RMOs cannot be met or adverse effects on TES fish cannot be avoided.</p>
RM-2	Adjust dispersed and developed recreation practices that retard or prevent attainment of RMOs or adversely affect TES fish. Eliminate the practice or occupancy in cases where adjustment measures, such as education, use limitations, traffic control devices, increased maintenance, facilities relocation, and specific site closures are not effective in meeting RMOs and avoiding adverse effects on TES fish.
RM-3	Address attainment of RMOs and potential effect on TES fish in Wild and Scenic Rivers, Wilderness, and other Recreation Management Plans.
<i>Minerals Management</i>	
MM-1	(PACFISH) Avoid adverse effects on listed species and designated critical habitat from mineral operations. Require a reclamation plan, approved plan of operations (or other governing document), and reclamation bond if the notice of intent indicates that a mineral operation would be located in an RCA or could affect attainment of RMOs or adversely affect listed anadromous fish. For effects that cannot be avoided, plans and bonds must address the costs of removing facilities, equipment, and materials; recontouring disturbed areas to the topography before the land was mined; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging or replacing topsoil; and preparing and revegetating seedbeds to attain RMOs and avoid adverse effects on listed anadromous fish. Ensure reclamation plans contain measurable attainment and band release criteria for each reclamation activity.

Standards and Guidelines	Conservation Measures
MM-2	Locate structures, support facilities, and roads outside RCAs. Where there is no alternative to siting facilities in RCAs, locate and construct the facilities in ways that avoid impacts on RCAs and streams and adverse effects on TES fish. Where there is no alternative to road construction, keep the number of roads to the minimum necessary for the approved mineral activity. Close, obliterate, and revegetate roads no longer required for mineral or land management activities.
MM-3	Prohibit solid and sanitary waste facilities in RCAs. If there is no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in RCAs and if releases can be prevented and stability can be ensured, then:
MM-3a	Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics;
MM-3b	Locate and design the waste facilities using the best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials; if the best conventional technology is not sufficient to prevent releases and ensure stability over the long term, prohibit these facilities in RCAs;
MM-3c	Monitor waste and waste facilities to ensure chemical and physical stability, and make adjustments to operations as needed to avoid adverse effects on TES fish and RMOs;
MM-3d	Reclaim and monitor waste facilities to ensure chemical and physical stability and revegetation to avoid adverse effects on TES fish and to attain the RMOs; and
MM-3e	Require reclamation bonds adequate to ensure long-term chemical and physical stability and successful revegetation of mine waste facilities.
MM-4	For leasable minerals, prohibit surface occupancy within RCAs for oil, gas, and geothermal exploration and development activities where contracts and leases do not already exist, unless there are no other options for location and RMOs can be attained and adverse effects on TES fish can be avoided. Adjust the operating plans of existing contracts to eliminate impacts that prevent attainment of RMOs and avoid adverse effects on TES fish.
MM-5	Permit sand and gravel mining and extraction within RCAs only if no alternatives exist, if the action would not retard or prevent attainment of RMOs, and adverse effects on TES fish would be avoided.
MM-6	Develop inspection, monitoring, and reporting requirements for mineral activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate impacts that prevent attainment of RMOs and avoid adverse effects on TES fish.

Standards and Guidelines	Conservation Measures
<i>Fire Management</i>	
FM-1	Design and implement fire suppression strategies, practices, and actions so as not to retard or prevent attainment of RMOs in the long term (see RA-6). Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression actions could perpetuate or be damaging to long-term ecosystem function or TES fish.
FM-2	Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of RCAs. If the only suitable location for these activities is within the RCA, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements, with avoidance of adverse effects on TES fish as a primary goal. Use an interdisciplinary team, including a fishery biologist, for fire prevention planning to determine incident base and helibase.
FM-3	Avoid delivery of chemical retardant, foam, or additives to surface waters. An exception is warranted where overriding immediate safety imperatives exist or if these materials are approved for aquatic use and pose no risk to TES fish. An exception may be warranted when the action agency, with concurrence from the resource advisor, fisheries biologist, or line officer determines an escape fire would cause more long-term damage to fish habitats than chemical delivery to surface waters.
FM-4	Design prescribed burn projects and prescriptions to contribute to the attainment of the RMOs.
<i>Lands</i>	
LH-1	Require instream flows and habitat conditions for hydroelectric and other surface water development proposals that maintain or restore riparian resources, favorable channel conditions, and fish passage, reproduction, and growth. Coordinate this process with the appropriate state agencies. When relicensing hydroelectric projects, provide written and timely license conditions to the Federal Energy Regulatory Commission that require fish passage and flows and habitat conditions that maintain/restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate state agencies.
LH-2	Locate new hydroelectric ancillary facilities outside RCAs. For existing ancillary facilities inside the RCA that are essential to proper management, provide recommendations to Federal Energy Regulatory Commission to ensure that the facilities would not prevent attainment of the RMOs and that adverse effects on TES fish are avoided. Where these objectives cannot be met, recommend to Federal Energy Regulatory Commission that these ancillary facilities should be relocated. Locate, operate, and maintain hydroelectric facilities that must be located in RCAs to avoid effects that would retard or prevent attainment of the RMOs and avoid adverse effects on TES fish.

Standards and Guidelines	Conservation Measures
LH-3	Issue leases, permits, rights-of-way, and easements to avoid effects that would retard or prevent attainment of the RMOs and TES fish. Where the authority to do so was retained, adjust existing leases, permits, rights-of-way, and easements to eliminate effects that would retard or prevent attainment of the RMOs or adversely affect native aquatic species or water quality. Priority for modifying existing leases, permits, rights-of-way, and easements would be based on the current and potential adverse effects on TES fish and the ecological value of the riparian resources affected.
LH-4	Use land acquisition, exchange, and conservation easements to meet RMOs and facilitate restoration of fish stocks and other species at risk of extinction.

General Riparian Area Management

RA-1	Identify and coordinate with federal, tribal, state, and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.
RA-2	Trees may be felled in RCAs when they pose a safety risk. Keep felled trees on-site when needed to meet woody debris objectives.
RA-3	Apply herbicides, pesticides, and other toxicants, and other chemicals in a manner that does not retard or prevent attainment of RMOs and avoids adverse effects on TES fish.
RA-4	Prohibit storage of fuels and other toxicants and refueling within RCAs unless there are no other practicable alternatives. Refueling sites and storage areas within an RCA must be approved and have an approved spill containment plan.
RA-5	Locate water drafting sites to avoid adverse effects on TES fish and instream flows and in a manner that does not retard or prevent attainment of RMOs.
RA-6	Do not undertake management activities that would retard attainment of trends toward improving aquatic and riparian habitats in restoration subwatersheds. Short-term adverse effects (discountable or negligible effects) are acceptable, if they would not preclude attainment of long-term improvement to aquatic and riparian habitats. Because of past land uses and habitat degradation (e.g., road encroachment on streams, dredge mining, fish passage barrier culverts), it is acceptable to have short-term adverse effects to achieve long-term benefits.

Watershed and Habitat Restoration

WR-1	Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of RMOs.
WR-2	Cooperate with federal, state, local, and tribal agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet RMOs.
WR-3	Do not use planned restoration as a substitute for preventing habitat degradation; that is, use planned restoration only to mitigate existing problems not to mitigate the effects of proposed activities.

Standards and Guidelines	Conservation Measures
<i>Fisheries and Wildlife Restoration</i>	
FW-1	Design and implement fish and wildlife habitat restoration and enhancement actions in a manner that contributes to attainment of RMOs.
FW-2	Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of the RMOs or adversely affect TES fish. For existing fish and wildlife interpretive and other user-enhancement facilities inside RCAs, ensure the RMOs are met and adverse effects on TES fish are avoided. Where RMOs cannot be met or adverse effects on TES fish avoided, relocate or close these facilities.
FW-3	Cooperate with federal and state wildlife management agencies to identify and eliminate wild ungulate impacts that prevent attainment of the RMOs or adversely affect TES fish.
FW-4	Cooperate with federal and state fish management agencies to identify and eliminate adverse effects on native anadromous fish associated with habitat manipulation, fish stocking, fish harvest, and poaching.

